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Research Article

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The Clinical Features of Heart Failure among Libyan Female Patients in Tripoli - Libya

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ABSTRACT

Although Heart Failure (HF) is a major cause of comorbidity and mortality worldwide affecting both genders, females are still under-diagnosed, treated and have not been adequately studied. To identify the demographic, clinical features and treatment modalities for heart failure among women admitted to the three teaching hospitals in Tripoli, the capital of Libya, from January 2021 to July 2022.

A descriptive, cross-sectional study included 165 female patients admitted with the diagnosis of heart failure, A self–constructed questionnaire was designed to collect data from medical records then sorted, coded, and analyzed by IBM SPSS Statistics for Windows version 20.

165 female patients with heart failure were evaluated; The results showed that the mean age was 60.9 ± 12.3 years, and 84.8% were housewives. Hypertension was the most prevalent comorbidity and cause of HF, in 55.8% and 56.9% of cases, respectively, the commonest presenting symptoms were dyspnea 93.9%, most of the cases were diagnosed as HFrEF, 47.8% of them were admitted due to poor compliance to treatment, and 15.8% due to arrhythmias. Only 5.4% of our patients received the full Guidelines Directed Medical Therapy (GDMT).

Conclusion: Heart failure with preserved ejection fraction (HFpEF) is still underdiagnosed in contrast to the Heart failure with reduced ejection fraction (HFrEF) category. The majority of the patients have several comorbidities. Only a minority of them received full GDMT.

Key words- *Female; Heart failure; Hypertension; HFpEF; HFrEF; GDMT.*

INTRODUCTION

Heart failure (HF) is a major cause of impaired quality of life and death in both sexes[1], the number of patients with HF becomes increased due to advancing in tools and methods of diagnosis. By 2030, the prevalence of heart failure expected to increase by 46%. With aging the incidence of HF doubles in men with each 10-year increase, and triples in the same time period among women.[2] This may be due to the fact that females usually have a higher survival rate after the onset of the disease, and as age advances prevalence increases when compared to males. However, after the age of 80, the incidence will be equalized between the two genders.[3,4] Regarding the etiologies of heart failure, response to treatment, and quality of care there is a well-known difference between males and females, in overall females are underrepresented in clinical trials, and therefore in clinical guidelines, It is known that women receive lower average drug doses, show more adverse effects[5-7], and in advanced HF therapy, such as heart transplantation and ventricular assistance, women received less frequently than men. Also, in the care process, resource use, and quality of care in patients with HF, there is a difference between the two sexes.[8,9]

Heart failure with preserved ejection fraction (HFpEF) is more prevalent in women and tends to develop at an older age compared to those with HF and reduced ejection fraction (HFrEF). Regarding hospitalization due to heart failure 53% of the patients had (HFrEF) and 47% had (HFpEF). Age-adjusted hospitalization and readmission rates are similar between women and men.[10-13] Men and women both exhibit the same signs and symptoms of heart failure (HF), however women experience exertional dyspnea and edema more frequently than men do.[14-16] Compared to males, women experience more despair, a lower quality of life, and less social interaction.[17–18]

Within 5 years of the diagnosis, half of the patients with HF will die and survival is significantly reduced in both genders compared to those without HF. Moreover, cardiovascular disease in women remains understudied, diagnosed, and treated.[19-21]

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In the last few years, many Arabic countries had started their national registries of cardiac diseases such as heart failure, which demonstrated the wide gap between real-life practice and the common heart failure guidelines.[22,23] Due to many circumstances, Libya lacks a national registry and studies on cardiovascular disorders. This study will focus on heart failure in female Libyan patients.

***Aim of the study*:** The current study was conducted aiming to identify the demographic and clinical features and treatment modalities for heart failure among Libyan women admitted to the main 3 teaching hospitals located in Tripoli, from January 2021 to July 2022.

MATERILS AND METHODS

A descriptive, cross-sectional, design was used to include 165 female patients admitted with the diagnosis of heart failure during the period from January 2021 to July 2022. All female Libyan patients who were admitted during the study period to the Cardiology Departments of Tripoli University Hospital, Tajora national cardiac center, and Maetiga hospital as a case of heart failure and of any age were included, with the exclusion of non-Libyan patients and male patients. Demographic and clinical information including age, occupation, residence, symptoms, New York Heart Association Functional Classification (NYHA) class, history of the previous admission, and regularity of follow-up, the effect of the disease, investigation result, and treatment received were extracted from the medical file records.

Collected data were sorted, coded, and analyzed by IBM SPSS Statistics for Windows, version

20 (IBM Corp., Armonk, N.Y., USA). Descriptive statistics including frequency, percentage, and mean ± standard deviation, were obtained for all variables as appropriate. Categorical data were compared using the Chisquare test and Fisher's exact test if appropriate. Quantitative data were compared using a student t-test. A $P < 0.05$ was considered statistically significant.

RESULTS

The profiles of 165 female patients with heart failure were evaluated; the results showed that their age ranged between 27 and 94 with a mean age of 60.9 ± 12.3 years, 52.1% were aged more than 60 years, 43% living outside Tripoli, and 84.8% were housewives, only 10.9% had normal BMI, everyone else was overweight or obese, 36.4% were irregular followng-up regarding their cardiac problem, of these 30.9% were attributed to social causes, the disease affects the social life of 68.5% of the patients. Only 22 (13.3%) patients had one co-morbidity, the others had more than one and were distributed as follows; 55.8% for hypertension, 54.5% for diabetes, and 35.2% for obesity (Table 1).

Regarding the clinical features; 12 (7.3%) presented with one symptom, the others had more than one symptom as 93.9% presented with dyspnea followed by 74.5% for edema then palpitation and fatigue in 43% and 36.9% respectively, more than half of the patients

(58.2%) diagnosed as HFrEF and 19.4% as HFpEF and the remaining 22.4% was HFmrEF; in 81.8% the diagnosis depends on signs, symptoms & and ECHO findings, NT- proBNP was (15.2%) only, the duration between diagnosis and start of treatment ranged between a few days and 2 years, with a mean of 39.5±72.8 days, only 20.6% start the treatment within 2 weeks of diagnosis and 18.2% in more than 1 month, concerning the etiology of HF in this sample,81(49.1%) patients had one cause all the others had more than one cause, hypertension was first in the rank making a percentage of 56.9% followed by 32.1% for VHD then 28.5% for IHD, 54.5% were in NYHA class III and only 3.6% in class I, only 26.7% had no previous admission for heart failure, 47.8% of them admitted because the poor compliance to treatment , 29.7% for treating infection, 15.8% to control AF (Table 2).

Relating to investigations available in the reviewed medical records, anemia was detected in 37.6% of the cases, high urea, and creatinine in 32.7% and 24.8% respectively, hyperkalemia in 7.9%, and high NT- pro-BNP in 15.2%, high LDL found in 17.6% and high HbA1c in 35.2%, abnormal coronary angiography found in 9.7% and normal in 15.8% but the other 74.5% had no comment about coronary angiography in their medical records (Table 3).

Concerning management; only 3 patients were treated with one drug, 10 patients with 2 drugs, and 152(92.1%) treated with more than 2 drugs, 93.3% receive B blockers, 84.8% on loop diuretics, 80% on ACI, and 79.4% on ARBs. (Table 4), regarding adherence to guideline directed medical therapy (GDMT) for patients with heart failure only 9 (5.4%) of our patients receive the 4 recommended medications, 24.2% receive 3 drugs, 55.8% received 2 of the GDMT recommended medications, and 14.5% were on only one from them, factors affecting GDMT adherence studied in more depth and found to be statistically insignificant for all the factors, but adherence was more among younger age (56.8±13.9 vs. 61.2±12.3), slightly more among those living in Tripoli, and in working women, those who have one disease in comorbidity were more adherent also who was on regular follow-up, dyspnea was the main symptom in all the 9 patients who were adherent to GDMT medications, history of any number of previous admissions decrease the rate of adherence to 4.1% from 9.1% for those who have no previous hospitalization.

Table 1: Sociodemographic features of admitted patients with HF (2021-2022).

Feature	Percentage
Age (years) Range	
40>	4.8
40-60	43
60<	52.1
Address	
Tripoli	57
Outside	43
Job	
Fulltime job	5.5
Housewife	84.8
Parttime job	9.7
BMI (kg/m^2) Range	
(Normal (18-24	10.9
(Overweight (25-29	47.3
(Obese (30-34	41.2
Co-morbidities	
Hypertension	55.8
DM	54.5
Obesity	35.2
Anemia	32.7
AF	27.9
COPD	13.3
Others	50.9
Follow-up	
Regular	63.6
Irregular	36.4
:Impact of disease on	
Education	2.4
Job	8.5
Social life	68.5
None	20.6

Table 2: Clinical features of admitted patients with HF (2021- 2022)

Clinical Feature	Percentage
Symptoms	
Dyspnea	93.9
Edema	74.5
Palpitation	43
Fatigue	36.9
Cough	20.6
Difficulty in sleeping	20.6
Diagnosis	
HFmrEF	22.4
HFpEF	19.4
HFrEF	58.2
Method of diagnosis	
Signs, symptoms & ECHO	81.8
ECHO & NTproBNT	6.1
ECHO	10.9
Not mentioned	1.2
The duration from diagnosis to treatment	
Within 2 weeks	20.6
weeks- one month 2	43
one month <	18.2
Missed data	18.2
Etiology	
Hypertension	56.9
VHD	32.1
IHD	28.5
Postmyoarditis	17.6
Tach cardiomyopathy	16.4
Others	7.3
Unknown	

Clinical Feature	Percentage
NYHA	
Class I	3.6
Class II	26.7
Class III	54.5
Class IV	13.3
Missed data	1.8
Previous admission	
In the last 3 months	15.8
In the last 6months	9.7
months 6<	18.8
None	26.7
Unknown	29.1
Reason for admission	
Poor compliance	47.8
Infection	29.7
AF	15.8

Table 3: Investigation result of admitted patients with HF (2021- 2022)

Investigation	Percentage
Hemoglobin	
(Low (≤11g/dl	37.6
(Normal (≥12g/dl	60
Missed data	2.4
Urea	
(High (>50mg/dl	32.1
(Normal (<50mg/dl	65.5
Missed data	2.4
Creatinine	
(High (≥1.5mg/dl	24.8
(Normal (<1.5mg/dl	73.3
Missed data	1.8
eGFR	
Stage 1	27.3
Stage 2	33.3
Stage 3a	10.9
Stage 3b	14.5
Stage 4	9.1
Stage 5	2.4
Missed data	2.4
Potassium	
(Hyperkalemia (≥5.3mmol/l	7.9
(Normal (3.5-5.3mmol/l	83.6
Missed data	8.5
NT-proBNP	
(High (>125 pg/mL	15.2
Missed data	84.8
LDL	17.6
(High (100-129mg/dl	20
(Normal (>130mg/dl	62.4
Missed data	
HbA1C	
High ≥5.5%	35.2
Normal ≥5.5%	23
Missed data	41.8
Coronary angiography	
Abnormal	9.7
Normal	15.8
Missed data	74.5

Table 4: Treatment received by admitted patients with HF (2021-2022)

Treatment	Percentage
No. of GDMT medication	
4 Medications	5.4
3 Medications	24.2
2 Medication	55.8
Only one	14.5
Beta blockers	93.3
Loop diuretics	84.8
Angiotensin-converting-enzyme inhibitors	80
Angiotensin receptor blockers	79.4
Mineralocorticoid receptor antagonist	29.7
Sodium-glucose cotransporter-2 inhibitors	12.7
Others	51.5

Table 5: Factors affecting GDMT adherence

Factor	Adherence		P value
	Yes	No	
Age (years)	56.8±13.9	61.2±12.3	0.335
Place of residence	5(6.4%)	88(93.6%)	0.469
In Tripoli	2(2.8%)	69(97.2%)	
Outside Tripoli			
Employment			
Working	2(8%)	23(92%)	0.348
Not working	5(4.3%)	134(95.7%)	
Co-morbidity			
One disease	3(11.1%)	24(88.9%)	0.109
More than one	4(3.2%)	120(96.8%)	
Follow-up			
Regular	6(5.7%)	99(94.3%)	0.712
Irregular	2(3.3%)	58(96.7%)	
Symptoms			
Dyspnea	8(5.2%)	147(94.8%)	0.461
Other than dyspnea	0(0%)	10(100%)	
Previous admission	3(4.1%)	70(95.9%)	0.423
Yes	4(9.1%)	40(90.9%)	
No			

DISCUSSION

Heart failure affects about 12 % of the general population and women comprising about 50% of patients with HF and those hospitalized due to HF.[4,24,25] However, data about the prevalence of heart failure in Libya is generally lacking. It is taught to be a major health problem that is depleting the health resources in Libya.

This study is the first of its kind in our country focused on the dimensions of HF and their impacts on the life of women.

Numerous research, especially in Arab nations, have examined heart failure (HF) as a condition affecting people in their middle to advanced years, which is consistent with our findings.[23, 26-31]

Obesity in women increased directly with age and had twice the risk of HF as reported in other regional studies.[28,32-34]

This can be attributed mainly to a sedentary lifestyle especially in the older age group, the lack of physical activity (84% housewives), a poor diet, and the increased consumption of fast food.[35-38]

About 69% of patients have severe social life disruptions due to a variety of factors, including limited mobility brought on by symptoms including exertional dyspnea and lower limb edema, as well as side effects from therapy, mostly from the use of diuretics.

Even while HFpEF is more prevalent in women[11,55,39-42], our results showed that it only accounted for 19% of cases, whereas HFrEF was the most common form among Egyptian women. This is the same surprising conclusion

that Hala and her colleague's observed.[43] Because HFpEF is still poorly characterized, some patients must seek out other medical services.[31]

The Majority of our patients have more than one comorbidity, such as HTN, DM and obesity, which can interfere with and affect the type and the dose of treatment and increase the risk of hospitalization.[44]

Since the majority of our patients are elderly and suffering from a debilitating illness, the precipitating risk factors for HF requiring hospital admission in women included in our study were uncontrolled AF in 16%, infection in 29.7%, and anemia in 38%. This is in contrast to another study that found that atrial fibrillation was present in 28.8% of patients, uncontrolled hypertension in 32.7% of them, and anemia in 35.4% of them.[27]

When we looked for the cause of HF in our cases, we discovered that silent killer HTN came in first (56.9%), third in the Arab region[10–12], and second in Western nations. However, all of these studies were conducted with both sexes, and the second cause of HF was valvular heart disease (32%).

Diabetes and hypertension are linked to coronary artery disease, which is less common in women before to menopause.[23, 28–30] In contrast, ischemic heart disease is observed in just 28.5% of our female population. Women are less likely than males to have cardiac catheterization and revascularization treatments[45–48], according to several researches comparing the sexes. These studies ascribed this to the fact that women had more microvascular illness, which is not immediately treatable by revascularization.[49] About 75% of our cases were undocumented, therefore the 10% of individuals with aberrant coronary angiography results that required revascularization are not typical.

Since some of them were detected within two weeks and 18% after a month, we observed delays in HF diagnosis. The reason why women are late seeking medical advice may be because they live far from medical services (43% of our cases are outside Tripoli) and lack of transportation (31). Some authors explain this by stating that women typically complain of unusual exhaustion and shortness of breath and do not associate these symptoms with a heart condition. According to previous research, women did not aggressively track their heart failure signs or seek prompt medical attention when they appeared.[50–51]

Women are more symptomatic and with higher frequency rates of exertional dyspnea and lower limb edema.[23,52,53] This correlates with our finding as dyspnea represented in 94% and lower limb oedema in about 75%. Since HF may be diagnosed clinically, physical evidence and presenting symptoms are used to diagnosis 81% of our patients. In addition, 98.8% of our patients, almost 97% of Saudi Arabian patients, and around 93% of patients in other GULF nations get echocardiographic evaluation, which is the gold standard for diagnosing heart failure.[23,29,30]

Regarding biomarkers, natriuretic peptide levels are usually higher in women and considered to be a stronger predictor of death in women with HF, currently, NT-pro BNP is a well-established, powerful biomarker for the diagnosis and prognosis of HF.[54-58]

Only 25 patients had NT-proBNP tested in this study, and only 15.2% of them had elevated levels. There is a notable and inexplicable underutilization of natriuretic peptides, which was also documented in a study by Abdelfatah et al., and this underutilization was linked to the test's high cost, lack of kits, and ignorance of its function in the diagnosis and treatment of heart failure.[31] This serves as the same rationale for our conclusion.

The effect of treatment in female patients has not been sufficiently studied, the use of basic treatment of HF in the form of diuretics, renin angiotensin system (RAS) inhibition, ACE inhibitors, or angiotensin receptor blockers in addition to beta blockers was 93%,85%, 80%, 79% respectively, which is high when compared to other studies involving both genders.[11,44]

Both beta blockers and ACEIs/ARBs were used at rates above 80%, which is consistent with findings from other studies that also included both sexes.[28–30] In one trial, a subset of patients with ambulatory heart failure had a beta-blocker usage rate of over 90%, which is quite comparable to what we found. However, in other investigations with both sexes, ACE inhibitors, aldosterone antagonists, and beta-blockers were administered to female patients.[57–60]

According to other studies, older women with heart failure were less likely than men to receive treatment suggested by guidelines.[61,62] Only 4.8% of our patients received the four recommended medications, 24.2% received three, 55.8% received two GDMT-recommended medications, and 14.5% were only on one. This was primarily because treatment was expensive, unavailable, and not covered by insurance in our country, which also contributed to poor compliance (48% of our cases). Some authors also mentioned that physicians' awareness of the guidelines for diagnosing and treating HF is less strict for women.[63-65]

CONCLUSION

Compared to the HFrEF group, which comprises the majority of identified patients, HFpEF is still underdiagnosed. The majority of the study's participants were elderly, obese, hypertensive women with much comorbidity. Additionally, a small percentage of them received full Guidelines Directed Medical Therapy.

RECOMMENDATIONS

We recommend that more research and attention should be given to heart failure in women. Additionally, more work should be done to diagnose patients who fall into the HFpEF group and to raise awareness among patients and physicians about the new, very successful medicinal treatment for heart failure.

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